US 64 CORRIDOR STUDY CRASH ANALYSIS

This report presents a summary of the Traffic Safety Analysis for the US 64 Corridor Study, Phase IIA. The analysis included roadway segments within the project study area and was segmented by evaluating comparable segments that were an adequate distance to provide for a meaningful analysis. The segments analyzed along US 64 included a total of 522 crashes, of which 3 resulted in fatalities and 3 involved pedestrians during the analysis period from August 2004 through July 2007. The segments analyzed along US 1/US 64 and US 1 included a total of 246 crashes, of which 1 resulted in a fatality. The accident rates for each segment along the corridor were compared to the statewide average for similar roadway types to determine if the segment exceeded the statewide average. The simple comparison of the roadway crash rate versus the statewide average crash rate identifies nearly one-half of all locations as having a potential highway safety concern. A more appropriate method is the critical crash rate method. The critical crash rate is a statistically derived number, which is greater than the average crash rate, that can be used to identify locations where crash occurrence is higher than expected for a given facility type. Safety measures could be considered for locations identified in this manner. For planning purposes the confidence level used to calculate the critical crash rate is 95 percent for rural areas and 99.95% for urban areas. The critical crash rate is beneficial as it accounts for exposure (volumes) and varying segment lengths. If a segment has an actual crash rate higher than the critical rate, the location may have a potential highway safety deficiency and should receive additional analysis. Table 1 shows each segment along the corridor that was analyzed and whether it exceeds the statewide average crash rate and the critical crash for a similar roadway type and configuration.

Table 1: Crash Rate Segment Analysis

Roadway	Segment Limits	Crash Rate[1]	Statewide Average	Critical Rate	Crash Rate Exceeded
US 64	US 64 Business to SR 1716 (Big Woods Road)/SR 1941(Seaforth Road)	57.3	96.84	119.40	None
US 64	SR 1716 (Big Woods Road)/SR 1941(Seaforth Road) to SR 1008 (Farrington Road/Beaver Creek Road)	68.79	96.84	118.38	None
US 64	SR 1008 (Farrington Road/Beaver Creek Road) to NC 751/SR 1001 (New Hill Road)	99.01	96.84	119.68	**Statewide Average**
US 64	NC 751/SR 1001 (New Hill Road) to SR 1163 (Kelly Road)	117.6	250.45	318.80	None
US 64	SR 1163 (Kelly Road) to NC 55	141.01	250.45	340.24	None
US 64	NC 55 to SR 1613 (Davis Drive)/SR 1011 (Salem Street)	55.52	250.45	322.22	None
US 64	SR 1613 (Davis Drive)/SR 1011 (Salem Street) to SR 1521 (Lake Pine Drive)	240.13	250.45	318.78	None
US 64	SR 1521 (Lake Pine Drive) to US 1/US 64/SR 1009 (Tryon Road)	255.46	250.45	313.38	**Statewide Average**
US 1/ US 64	SR 3977 (Cary Parkway) to US 64/SR 1009 (Tryon Road)	223.16	142.59	188.41	**Statewide Average**
US 1	US 64/SR 1009 (Tryon Road) to SR 1010 (Ten Ten Road)	74.37	142.59	181.69	**Statewide Average and Critical Rate**

[1] – Crash rate is in crashes per million vehicle mile traveled from August 2004 through July 2007.

Only one segment analyzed resulted in the crash rate exceeding both the statewide average crash rate for similar facilities and the critical crash rate. This segment is not within the limits of the proposed project, however was included due to the proximity to the project and that the US 64 corridor shares a common alignment with US 1 east of the project.

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The one segment was along US 1/US 64 from the Cary Parkway interchange to the SR US 64/Tryon Road interchange. The segment had a total of 169 crashes including 107 rear end collisions due to a vehicle being stopped or slowed down (63 percent), and 23 crashes involving sideswipes between vehicles traveling in the same direction (14 percent). It should also be noted that the period of analysis includes a majority of the timeframe when the segment was under construction and may not be representative of normal conditions.

In addition to the analysis of roadway segments the crash evaluation included the analysis of individual intersections and interchanges along the US 64 corridor. A total of 19 intersections and 3 interchanges were analyzed. Unlike for roadway segments, individual intersections and interchanges do not have statewide averages to compare against to determine the magnitude of the crash rate. In order to make a relative comparison between locations it was determined that using a normal distribution where an average value for the corridor with bands for each standard deviation from the average would be the most appropriate. This type of analysis would show that accident rates within 1 standard deviation of the average would be considered normal (this would capture approximately 68% of all intersections), while those between 1 and 2 standard deviations (capturing 95% of all intersections) would be considered above normal and anything beyond 2 standard deviations would be considered substantially above normal. Table 2 shows each intersection and Table 3 shows each interchange along the corridor and their crash rate and where the rate falls on the normal curve spectrum.

Table 2: Crash Rate Intersection Analysis

Intersection	Total Crashes	Fatal Crashes	Crash Rate[2]	Frequency Level
Tryon Road and US 1 NB Ramp/Regency Parkway	25	0	57.80	Normal
US 64 and Edinburgh Drive	20	0	38.86	Normal
US 64 and Gregson Drive	24	0	58.45	Normal
US 64 and Mackenan Drive/Chalon Drive	9	0	21.92	Normal
US 64 and Autopark Boulevard	4	0	11.24	Normal
US 64 and SR 1541 (Lake Pine Drive)	35	0	79.91	Normal
US 64 and Shephards Vineyard Drive	28	0	78.68	Normal
US 64 and Knollwood Drive	2	1	5.89	Normal
US 64 and Laura Duncan Road	41	0	99.58	**Above Normal**
US 64 and SR 3074 Fern Valley Road)	0	0	0.00	Below Normal
US 64 and Green Level Church Road	28	0	55.36	Normal
US 64 and SR 1163 (Kelly Road)	34	0	109.72	**Above Normal**
US 64 and Kellyridge Road	0	0	0.00	Below Normal
US 64 and SR 1601 (Jenks Road)	8	0	28.99	Normal
US 64 and NC 751/SR 1001 (New Hill Road)	41	0	167.16	**Substantially Above Normal**

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Intersection	Total Crashes	Fatal Crashes	Crash Rate[2]	Frequency Level
US 64 and SR 1008 (Farrington Road/Beaver Creek Road)	13	0	55.47	Normal
US 64 and SR 1716 (Big Woods Road)/SR 1941(Seaforth Road)	6	0	28.99	Normal
US 64 and SR 1700 (Mt. Gilead Church Road/North Pea Ridge Road)	4	0	23.57	Normal
US 64 and SR 1991 (Foxfire Trace)	0	0	0.00	Below Normal
Average			48.50	
Standard Deviation			44.13	

[2] – Crash rate is in crashes per million vehicles entering the intersection from July 2004 through August 2007

Table 3: Crash Rate Interchange Analysis

Interchange	Total Crashes	Fatal Crashes	Crash Rate[2]	Frequency Level
US 1/US 64 Interchange	274	0	292.66	**Above Normal**
US 64 and Davis Drive Interchange	46	0	97.7	Normal
US 64 and NC 55 Interchange	88	0	140.99	Normal
Average			177.12	
Standard Deviation			102.38	

[2] – Crash rate is in crashes per million vehicles entering the intersection from July 2004 through August 2007

As shown in Tables 2, two intersections are above normal and one intersection is substantially above normal. Table 3 shows that one interchange has an above normal frequency level. Table 4 shows the types of crashes for each intersection or interchange.

Table 4: Above Normal Crash Rate Analysis

Intersection/ Interchange	Object	Angle	Pedestrian	Head On	Left-turn	Ran-off Road	Rear End	Right-turn	Sideswipe	Other
US 64 and Laura Duncan Road	0	5	1	0	0	1	23	0	6	0
US 64 and SR 1163 (Kelly Road)	2	0	0	0	2	0	29	0	0	1
US 64 and NC 751/SR 1001 (New Hill Road)	0	3	0	1	19	0	11	3	3	1
US 1/US 64 Interchange	17	1	0	0	2	17	199	3	27	8

US 64 at Laura Duncan Road : High rate of rear end collisions and high percentage of wet pavement crashes.

Potential Countermeasures:

- Prohibit turn movements
- Provide "Slippery When Wet" Sign
- Reduce speed limit on Laura Duncan Road
- Install or improve warning sign

US 64 at SR 1163 (Kelly Road) : High rate of rear end collisions.

Potential Countermeasures:

- Prohibit turn movements
- Reduce speed Limit on Kelly Road
- Install or improve warning sign

US 64 at NC 751/SR 1001 (New Hill Road) : High rate of left-turn collisions.

Potential Countermeasures:

- Prohibit turn movements
- Improve signal timing or add protected phase
- Provide turning guidelines for left-turn movements

US 1/US 64 Interchange : High rate of rear end collisions especially at interchange ramp connections.

Potential Countermeasures:

- Improve traffic operations to reduce queuing
- Provide additional storage lanes for queued vehicles
- Install or improve warning sign

North Carolina Highway Safety Improvement Plan

The purpose of the North Carolina Highway Safety Improvement Program (HSIP) is to provide a continuous and systematic procedure that identifies and reviews specific traffic safety concerns throughout the state. Within these areas are determined the potentially hazardous (PH) locations that are possibly deficient. The ultimate goal of the HSIP process is to reduce the number of traffic crashes, injuries, and fatalities by reducing the potential for these incidents on public roadways. The HSIP classifies both segments and intersections and looks for specific warrants. Table 5 shows the segments and intersections that were identified in the 2007 HSIP.

Table 5: HSIP Locations

Intersection/Interchange	Warrant	State Rank
US 64 and NC 751/SR 1001 (New Hill Road)	I-1: Frontal Impact	405
US 64 and Shepherds Vineyard Drive	I-1: Frontal Impact	566
US 1/US 64 Interchange	I-4: Night Location Without Streetlights	900
US 64 and Davis Drive Interchange	I-4: Night Location Without Streetlights	1846
US 64 and NC 55 Interchange	I-4: Night Location Without Streetlights	2284
Segment	**Warrant**	**State Rank**
None	N/A	N/A